

President - Tom Scorsone, KC2FCP
Secretary - Steve VanSickle, WB2HPR

Vice-President - Nick Field, KD2JCR
Treasurer, Webmaster & Newsletter Editor - Bryan Jackson, W2RBJ
Board Members: David Jaegar, Jr., K2DEJ - Russ Greenman, WB2LXC - Dave Gillette, KC2RPU

Amateur Radio: What's It Worth?

ARES Connect Keeps Track

Public service is a big part of Amateur Radio. In fact, it's one of the biggest reasons why many Hams get their licenses. And, to help coordinate their efforts is the ARES program -- The Amateur Radio Emergency Service.

ARES consists of licensed amateurs who have voluntarily registered their qualifications and equipment with their local ARES program. In the Eastern New York Section of the ARRL, ARES consists of fifteen counties centered on the Hudson Valley. When disaster strikes, the program allows these Amateur Radio communication resources to be coordinated and made available wherever they're needed. While ownership of emergency-powered equipment is desirable, it is not a requirement for membership.



Many Amateur Radio organizations, including EGARA, regularly provide communications at public service events, as well as emergency training activities such as Field Day. Others participate in emergency programs such as SKYWARN, in which Amateur operators report severe weather conditions to the National Weather Service so it can track storms and issue alerts.

When taken all together, these efforts amount to thousands of hours of time contributed by Amateur Radio volunteers. But until recently it was difficult to track both the amount of time volunteered and its in-kind value. Now, the job is much easier thanks to ARES Connect.

-continued on page 3-

In This Issue

Page 1 - ARES Connect / Strange Signals
Page 2 - Extra Class Questions Being Updated
Page 5 - On the Beam News & Notes
Page 6 - Meeting Minutes / Ham It Up
Page 7 - Wonders of the Ionosphere
Page 8 - History of Ham Radio - Females!
Page 10 - Hamfest 2020 Sponsors
Page 12 - Calendar / Buy, Swap, Sell / Pro Tip

President Scorsone Won't Seek Re-Election

After 19 years as club president, Tom Scorsone, KC2FCP, has decided not to run for re-election. As approved by the membership last year, Tom will become President Emeritus and continue to serve the club as its key advisor.

As a result, club members will elect a new president during the annual elections at the April membership meeting. The offices of Vice President, Secretary and Treasurer will also be on the ballot, as they are elected annually.



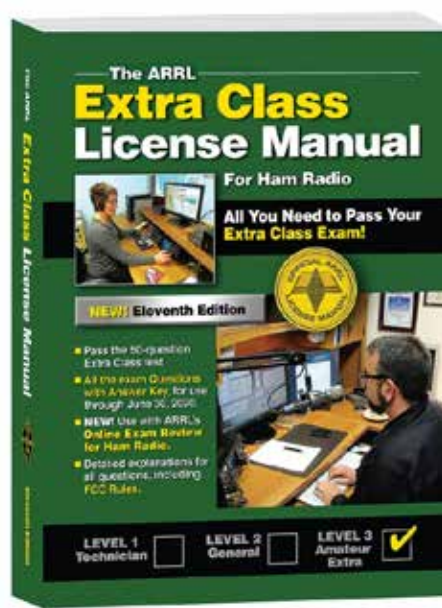
-continued on page 4-

Tom Scorsone will step down after two decades as president

Next Membership Meeting - March 11, 2020

New Amateur Extra Question Pool Released

New Questions On Digital Modes May Make Exam More Challenging For Those Seeking To Upgrade



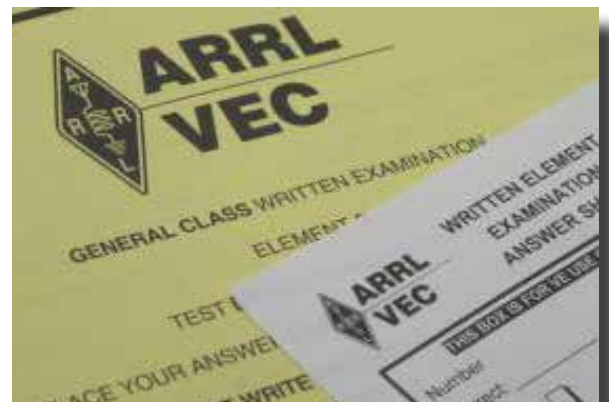
The new Amateur Extra-class license examination question pool has been released and is available at the National Conference of Volunteer Coordinators (NCVEC) website at, <http://www.ncvec.org/>. The pool will be used for Extra class exams from July 1, 2020, through June 30, 2024.

The 2020-2024 Extra-class pool incorporates significant changes compared to the current 2016-2020 question pool, which expires on June 30. The number of questions in the pool has been reduced from 712 to 622. The result is 239 modified questions, 49 new questions, and 139 questions removed. The changes were made because NCVEC felt an abundance of questions were outdated. At the same time, it was decided to add questions about new technologies and subjects.

The NCVEC also sought to balance the difficulty level of the new Extra exams by removing or replacing some questions deemed too easy or too difficult when compared to the rest of the pool. The 2020 pool has 10 diagrams, two fewer than the 2016 question pool.

Lower class license holders who are looking to upgrade may wish to consider taking their Extra class exam before the new pool of questions goes into effect, especially if they aren't familiar with developments involving digital modes.

A number of VE exam sessions are scheduled to take place prior to the July 1st changeover, including EGARA's which will be held on May 16th at the East Greenbush Library starting at 10 am. Details are on the club's website (www.EGARA.club). The "old" pool of Extra Class questions will be used for the May exam session.



For those looking to upgrade, there are many excellent resources to explore. One is ARRL's Extra Class license manual which is available for \$29.95 (<http://www.arrl.org/shop/ARRL-Extra-Class-License-Manual-11th-Edition/>). However, there are also many free license study guides and practice exams posted on the Internet and a quick search will lead you to them.

General licensees may upgrade to Extra Class by passing a 50-question multiple-choice examination. No Morse Code test is required. In addition to some of the more obscure regulations, the test covers specialized operating practices, advanced electronics theory and radio equipment design.

In addition to having access to ALL Amateur Radio Bands, Extra Class hams enjoy the prestige that comes with having obtained the hobby's most advanced licensing class.

ARE\$ Connect Proves Worth of Amateur Radio...

At EGARA's February meeting, ENY Section Emergency Coordinator Dave Galletly, KM2O, provided an overview of the ARES Connect program and how it works. In addition, club members had the opportunity to sign up for the program following the meeting.

The key to making the program work is to get Amateur operators to become an ARES team member by registering themselves and their skills. The process only takes a few minutes and can be done online at: <http://vhub.at/aresconnect-ENY>. Once registered, you will have the ability to record events in which you have participated, as well as sign-up for upcoming events such as weekly Emergency Services Nets, RACES and ARES meetings, and training programs.

In addition to identifying Amateur Radio operators and communication resources that can be utilized during an emergency, ARES Connect can also track the value of the activities in which Hams participate. This is critically important, as the information is useful for everything from applying for federal grants to justifying Amateur Radio spectrum space.

"In the Eastern New York ARES District, we estimate volunteer activity by our members is worth \$30.18 per hour," said Galletly. "In 2019, we recorded approximately 4,040 hours of service, resulting in a total worth of \$121,869.28."

According to ARES records, service events and hours provided by Eastern New York State members were as follows:

541 Separate Events In ENY In 2019

• Training & Exercise	498
• Public Service	37
• Emergency	1
• SKYWARN	5
• TOTAL	541

Hours of Service Volunteered

• Training & Exercise	2118.29
• Public Service	1881.90
• Emergency	16.00
• SKYWARN	27.25
• Total Hours	4043.44

"Documenting the volunteer work and hours provided by Amateur Radio can't be emphasized enough," said Galletly. "Because if you didn't document it, you didn't do it."



Dave Galletly, KM2O, shows the event calendar that is part of the ARES Connect site

"Unfortunately, these numbers don't reflect all of the service events and hours that Hams in our district contributed because many have still not registered with ARES Connect to log their work," Galletly said. "We saw an enrollment increase of about 18 percent last year, and we're hoping our outreach efforts will keep them momentum going."

Galletly said there are also several improvements now in the works to make ARES Connect even more useful and powerful. These include adding new features and categories to the system to allow more effective use by organizational users, including local clubs such as EGARA.



EGARA club member Don Mayotte, KB2CDX, registers for ARES Connect during the February meeting as Dave Galletly, KM2O looks on.

More on ARES is at:
<http://eny.arrl.org/ARES/>

Scorsone Stepping Down After 19 Years as EGARA President

Members Urged to Consider Running in April Elections

At the March membership meeting, nominations will be solicited for the April elections. Members are being urged to consider running for one of these offices or offering the nomination of a club member who they believe will serve well in one of these leadership positions.

“After nearly 20 years, it’s time to turn the reins over to someone new,” Scorsone said. “I’ve been honored to have been re-elected year after year, and I have enjoyed being with so many great people as we have together to grow the club and activities like our Hamfest. Now, I look forward to continuing to serve the club as its President Emeritus.”



Scorsone reminded those interested in leading the club that to remember that each of the positions as an officer comes with responsibilities and commitment.

“These include attending monthly board meetings and overseeing club activities,” he said “The duties of club officers do not generally take a lot of time, but they are vitally important to its progress and relevance.”

Club officers also work to maintain the Masonic Lodge and its grounds. In return, the club uses the building free of charge for meets, equipment storage and activities such as Field Day. The officers and board members meet on the second Monday of each month (except July and August) to clean the building and then to discuss club business and the meeting agenda. This requires roughly an hour of time.

In addition, during summer months, the leadership team works with other club volunteers to maintain the building grounds by mowing the lawn and controlling weeds as needed. A riding mower and push mower are supplied for these duties. Again, this usually requires an hour or so to complete, but the work is usually spread among several members who help out.

“With leadership comes commitment,” Scorsone said. “But it’s also rewarding, so I hope each member will consider these opportunities.”

While club officers are elected to one-year terms, board members are elected every three years, with the next election of the board set for next year. However, club members will be asked to consider whether they might want to stagger board terms so that one board seat is open for election each year. To accomplish this, next year the three board seats would be filled for one, two and three year terms initially, with each board position reverting to full three year terms after that. This would offer club members more opportunities to serve by ensuring that one board seat would be available during each annual election.

“The future of our club depends on the involvement and leadership of our members,” Scorsone concluded.

On the Beam

News & Notes

Getting Ready for EGARA Hamfest #19

May might still seem a long way off, but it's really only a couple of months away -- and that means EGARA's annual Hamfest is coming up rapidly as well!

This year will mark the club's 19th Hamfest and preparations are already underway to make it even better than last year's event, which included over \$2,500 in prizes and giveaways. During the February meeting, club President Tom Scorsone, KC2FCP, outlined the plans for Hamfest 2020, as well as a review of the many jobs that will need to be filled.

For the first time, this year's event will feature Team Leaders who will each oversee a particular work area. These include: Admission Gate, Traffic Management and Parking, Food Preparation and Kitchen Management, Ticket Sales, and Set Up/Clean Up Management. During the February meeting, over 20 members signed up for various job duties.

Admission prices for Hamfest 2020 will once again be just \$6.00, with tables costing \$10 each. However, each table purchase will include an admission ticket.

Tailgating will also be included free with the basic admission ticket. In addition, Extra Chance tickets will be available for \$4.00 each, providing extra opportunities to win door prizes and the Grand Prize of an HF/6 meter transceiver.

As a special thank you, each paid admission will also receive an EGARA ballpoint pen, as well as a chance to enter the drawings for the many door prizes. This year, the club has reached out to over 40 Amateur Radio vendors and suppliers to offer them sponsorships. The list of sponsors as of February 27th can be found on page 10.

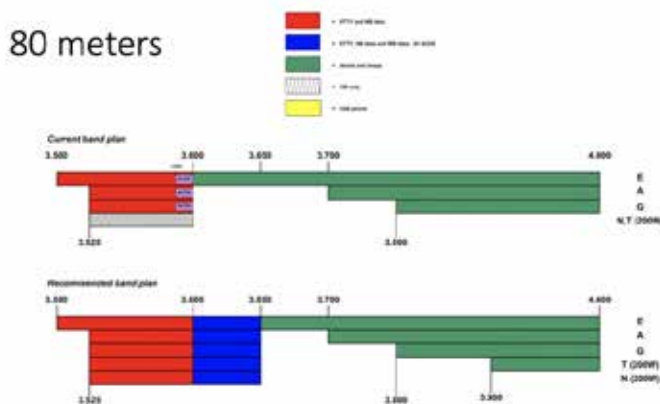


Hamfest 2019 drew a big crowd, making it the club's most successful ever. Plans are already underway to make the 2020 event even better.

New Band Plan Committee Set Up

ARRL has created a new HF Band Planning Discussion Group. HF Band Planning Committee Chair Mike Raisbeck, K1TWF, will moderate the group, which will focus on the League's HF Band Planning Committee's recommendations and other band-planning activities.

Last month, the ARRL HF Band Planning Committee invited comments and suggestions from the Amateur Radio community on its report to the ARRL Board. At the Board's January meeting, the committee presented its specific recommendations in graphical form for each HF band and each US license class, with the goal of increasing harmony on the HF bands, particularly between CW and digital users.



Those responding to the initial call for comments and suggestions are encouraged to cross-post their remarks to the new discussion group. Those interested in joining the group should visit: <https://groups.arrl.org/g/ARRL-HF-Band-Planning>.

EGARA February Meeting Minutes

- The February meeting of the EGARA was called to order at 7:15 PM by President Tom Scorsone, KC2FCP. Ridge Macdonald, KB2HWL, drew raffle tickets for numerous prizes.
- The monthly treasurer's report was given and approved. Dues were accepted, and members were reminded that they may renew by using PayPal on the EGARA.club website, as well as in-person. Several members have opted for 5-year renewals, enjoying a savings. Also, ARRL dues can be submitted through club Treasurer, Bryan Jackson.
- A VE session will be conducted in May, following the Hamfest. The current Extra class question pool will be updated on July 1st.
- Tom Scorsone called for nominations for officers and the board of directors. Annual elections will be held at the April meeting. Tom also told members about the responsibilities of club leadership, and that EGARA is fortunate to have the meeting facilities at the Masonic Temple – but only through an agreement with the Masons to provide janitorial and grounds maintenance in return.
- Tom continued to tell about the benefits of the Hamfest and that the money earned helps to offset the cost of member dues. All members are encouraged to participate in one of the several teams that help run the Hamfest. A sign-up sheet was circulated for members to sign. To date, Walter Snyder, N2WJR will be Team Leader for Gate Ticket Sales and Steve Marsh, KC2USX will head up parking.
- Once again, the Grand prize will be another HF transceiver, as a part of over \$2,500 in prizes and give-aways. Extra raffle tickets will be available for sale. Each paid admission will receive a commemorative pen.
- Suggestions for the March meeting were discussed. Also, a SKYWARN training session will be held on April 7. Don Mayotte, KB2CDX donated a computer which is being used for all club publications and internet activities. Regarding the 220 repeater – we have high hopes to begin installation in spring, following months of delays.
- After the business meeting, David Galletly, KM2O gave a power point presentation entitled ARES Connect, which is a new administrative system used to coordinate and track ARES activities. Dave gave a thorough overview of the system, and demonstrated a sign-in kiosk for use in recruitment and for sign-in at ARES events. A brief question and answer period followed the presentation.
- The meeting was adjourned by 9:45 PM. As customary, refreshments of coffee, soda, and pizza were provided to all the attendees.

--de Steve VanSickle WB2HPR / Secretary



Ham It Up

Wonders of the Ionosphere

By Steve VanSickle, WB2HPR

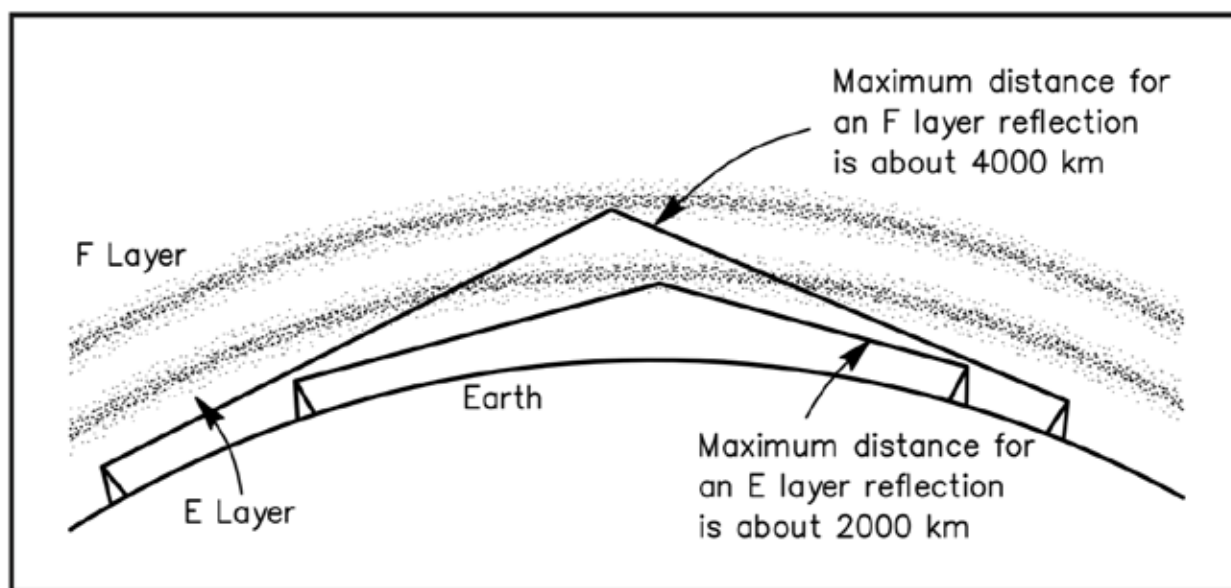
During a recent early evening QSO on 75 meters, several comments were made about the changes in propagation which seemed to occur at the same time each night. In reality, these changes were caused by changes in solar radiation -- as night followed day with the earth's rotation.

As the earth turns on its axis, and night approaches, the direct effects of the solar flux diminish, and the ionization in our upper atmospheric regions begins to diminish as well. These ionization changes, in turn, have a profound effect on the composition of the ionosphere's various layers. For instance, the D layer is dispersed, allowing MW and HF signals to travel to our F1 and F2 layers, allowing local, and then long distance propagation to occur.

The changes can be so abrupt that -- in a matter of seconds -- local skywave contacts are greatly attenuated, and long distance (skip) conditions prevail, until sunrise the next day. Then, with an increase in solar radiation, the F2 and F1 layers recombine, and the D Layer is reformed, limiting MW and HF signals to mainly ground wave and direct wave paths.

As this cycle of ionospheric movement and recombination repeats, you will observe a direct correlation with the day/night cycle. Sometimes, these changes occur so quickly, it seems that someone is throwing a switch when the "band goes long" -- meaning that our signals are no longer being reflected by the F1 layer, but rather the F2.

The degree of solar flux is affected by the sun spot cycle. Generally speaking, the greater number of sunspots, the greater the flux. We are just seeing the beginning of cycle 25, and based on historical records, we are projected to see a peak in sun spots in about five to six years. So, in other words, the effects of day /night propagation will grow to be ever greater than now.



It is interesting to observe this phenomenon, and much time and expense has been devoted to the field. The current (March 2020) issue of QST has some information regarding ionospheric studies starting in early 20th century to the present. But much remains to be learned, and the scientific community continues to expand our knowledge.

There are many reference works that you can study to help understand how our ionosphere behaves. One excellent book is *Propagation and Radio Science*, an ARRL publication that offers a detailed explanation of radio propagation, and is a good aide to understanding how radio signals travel. Also, in chapter 23 of the *ARRL Antenna Book*, there are 38 pages of detailed information, along with an extensive bibliography to help you expand your knowledge base.

The next time you are on the HF bands, and you notice that the signal paths begin to change, thank the sun, and its profound effect on our planet and our radio waves. 'Til next time -- 73 and good DX!

The History of Ham Radio: New Hams (female)

Chris Codella, W2PA, author, John Pelham, W1JA, editor, Phil Johnson, W2SQ, editor

(Editor's note: By special arrangement with the authors, Sidebands is pleased to present this multi-part series on the history of ham radio. Subsequent chapters will be published in future monthly editions of the newsletter)

While somewhat greater in number than before the war, women hams were still regarded by other amateurs with a mixture of curiosity and amusement. Nevertheless, even before the war several were already experienced as telegraph operators and had become prominent in message handling as amateurs. Coincident with the closing down of amateur activity for the war, an editorial in August 1917 announced that "The Ladies are Coming," reporting that "several hundred of the fair sex" were now among the brethren, so hams would need an alternative to OM as an on-air label. It was clear that OW would not work in the face of understandably strong objections from those who would have to bear the label. The editor suggested DG (dear girl) as a possible alternative but there was no consensus yet.

As the new decade began, though women were still excluded from many roles and activities in society, including voting, becoming a ham needed no man's permission, just the will and skill to pass a licensing test.

The first QST article written by a woman appeared in the July 1920 issue, a few pages away from the description of Maxim's state-of-the-art spark station. The author of "How to Build a Wireless Station" was twenty-one-year-old Marion Adaire Garmhausen of Baltimore. She also had written a letter published in the same issue thanking the League for her new membership certificate, of which she was quite proud, but asking the editors to correct the spelling of her last name on it (which ends in 'n,' not 'r'). Like other women of the time she was trained as a telegraph operator, but unlike most she had been introduced to wireless as a hobby when she happened to see an issue of QST and wrote to the League for more information.

In a box under her article's by-line the editor wrote "No, we're not starting a Women's Auxiliary—not quite yet. But they're getting in the game fellows, and soon it will be Marcelle Waves4 vs. the Hertzian brand. Mrs. 8ER should watch her laurels. In this story Miss Garmhausen gives an account of how a 'Ham (F.)' breaks in."



Marion Adaire
Garmhausen, 3BCK

With humor that survives time and seems current even today, she described her "efforts to 'get into the game.'" After longing to "hear some radio," and then consulting with the wise guys at the local radio shop and enduring their snide remarks, she appealed to her parents to let her put up an aerial on the roof of their home.

Aghast, her father replied that aerials and masts "would be a constant menace" and warned that "the less [she] tramped around on the roof the better off [she'd] be." Her mother worried that she would make the roof leak and forbade her from ever going up there!

"So, having secured their permission," she wrote, without missing a beat, "I borrowed a ladder from the lady next door and climbed to the roof."

Despite discouragement from both parents and admitting to a "decidedly limited" radio knowledge (although she had a commercial license, something she dismissed as simply learning what the book said; applying the knowledge was a "different matter"), she managed to get an antenna in the air. Upon connecting it up, she was thrilled to hear various stations coming through:

...behold! thru the stilly night purred the beloved sounds into my eager ear. And I just want to say, if any of you remember the first signals you ever heard on your own set, AIN'T it a gran' and glorious feelin'?

She was particularly excited about hearing the time signals from NAA in Arlington.

-continued on page 9-

History of Ham Radio...

“Pop-eyed with joy I rushed downstairs and embraced my startled mother. I danced a Highland Fling around the kitchen singing, ‘I heard Arlington—I heard Arlington.’ If the lad who had sent those gladsome words had known the excitement he caused in our camp he would have been amazed. Nightly thereafter I listened for the time.”

She described improving her setup with a tuned circuit and a disconnection switch for lightening protection. “Go ahead and laugh,” she wrote, “I expect it. But wait till my Audion and amplifier arrives that I sent for back in the dim ages. I shall defy a flickering smile to cross one face, for I expect to hear the soup chorus of the Esquimeaux at six p.m. every day. And when I have perfection in receiving sets I shall construct a transmitting set that will make the night hideous for the whole United States. One thing I have discovered about radio – is never as hard as you think it is going to be. When you get started everything works out like magic.”

Garmhausen’s article was such a big hit with QST readers that it led to a series of others shortly afterward. In September, “Beginning at the End” appeared, written by someone identified only as “The Old Woman” inspired, she said, by Miss Garmhausen. The writer (possibly Garmhausen’s own alter ego, as T.O.M. was Maxim’s) complained that she must constantly deny being Mrs. Candler, and what a shame it was that women were being passed over for operating positions by the military stations even though they had operator’s licenses.

In a box leading into this article the editor promised to reserve the moniker “T.O.W.” for her if she would continue to write. And, taking his cue from the recent landmark constitutional news, commented that since the state of Tennessee had “recognized woman and admitted her into participation in general activities, so we guess we will too.”

Then in November, QST noted that, “Baltimore will boast of having a Ham this coming winter, but Duvall [E. B. Duvall, 3EM, Eastern Maryland District superintendent] says he is a little skeptical as to the use of the word ‘ham,’ as he is informed that she is equipped with a First Grade Commercial License. He won’t give out her name or call letters yet, but says if anyone mentions the name he’ll whistle.”

The next spring a poem appeared, addressed as “Lines to Miss M. A. G.”

Oh Lady Bug! Dear Lady Bug!
If it could only be
That all the girls were just like you,
So quiet, friendly, frank and true
And yet could laugh the way you do-
They’d make a hit with me.
But when I mention Radio-
That fascinating game-
To any other lady-fair,
She’ll wiggle, giggle, pout or stare
Or turn her back and fix her hair;
The poor benighted dame.
Now with you, friend, its different;
You’re ‘there’ in every way.
When e’er talk this wireless stuff

You hold you own without a bluff
And never seem to hear enough.
That’s what I call ‘OK’.
And when you start to slinging code
That’s when I like to be
Asittin’ with my bulbs alight,
The pencil flying, phones clamped tight—
Say! I could listen half the night
When you are at your key.
Now, as I mentioned just above,
If all the girls could be
As nice as you, and use their heads
For other things than millin’ry spreads
And paint displays in creams and reds,
They’d sure appeal to me

-continued on page 11-

Save on Dues with Multi-Year Discounts!

EGARA members can now save money on their dues when they take advantage of multi-year discounts.

On-line payment at www.EGARA.club/dues is convenient, quick, safe and convenient!

Hamfest 2020 Sponsors

(As of 2/27/20)

*Please support our
Hamfest sponsors!*



**MOUSER
ELECTRONICS**

www.mouser.com



ARRL The national association for
AMATEUR RADIO®

www.ARRL.org



BTECH

baofengtech.com



<https://www.kjielelectronics.com>



<https://www.dxengineering.com>



<https://www.n3fjp.com/>



<https://www.mfjenterprises.com/>

History of Amateur Radio... Ladybugs Join

Garmhausen published her second QST article¹⁰ in May 1921, a humor piece in which she talked about “breaking out with the Hookups,” a story of becoming obsessed with trying new arrangements of apparatus, never quite getting it right, and finally returning to what she started with, but with less money for all the effort.

The cover of that issue depicted a woman wearing headphones—the fifth time a woman had appeared on the cover of QST, and one which drew several letters. The illustration, a drawing of a well-known local model (unnamed), had been donated by The Grogan Photo Systems Company of Milwaukee, which did commercial illustrations. Its publicity manager was a member of the local ARRL affiliated club and had arranged the donation.

Under the call sign 3BCK, Garmhausen was profiled in QST the following year, along with another prominent YL, twenty-year-old Winfred Dow, 7CB, who had been active on the air since 1916, took second prize in the Washington’s Birthday Relay test, and was currently ARRL District Superintendent in Tacoma, Washington. Garmhausen became known as “the first YL”—a sort of female version of Vermilya, even though in the presence of 8NH (now 8ER) and 7CB she clearly wasn’t—and was mentioned as such in QST as recently as 2002.

Further illustrating the conditions women endured to work in wireless, Edward T. Jones wrote a letter to QST on the subject of women in radio—“Give the Fair Sex a Chance.”¹⁶ He started out amusingly:

“A great majority of radio bugs will no doubt disapprove of my suggestions in that behalf, because they would rather have the fair damsels where they can throw their lamps at em’ now and ‘en—so to speak. Especially so now-a-days with those low cut ‘everything’s.’ You know what I mean. Then you young rascals must remember that there are the serious minded gentlemen who have either lost their eyesight or have been married so long that their only wish is to die. However, they want to see the Radio Female enthusiast given a chance and I am one of those type.”

He went on to suggest that since women who were interested in radio had “absolutely no chance” to progress up the ranks of commercial wireless operators because companies would never assign them to be operators on a ship, apparently a prerequisite for further advancement. He suggested an alternative that would even be acceptable to the “cons on the suffragist ticket.”

“Everyone who has held an executive position in a Radio Corporation or in a corporation related to Radio in some way or another, knows only too well the trouble experienced in breaking in a female stenographer. The radio terms just make her sick—she never knows (nor cares to know) what you are driving at...”

Therefore, as an alternative to the inaccessible path to advancement as an operator, he suggested that they instead could combine radio knowledge with stenography and become a valuable asset to any company involved in radio—a “radio stenographer.” He said they’d be in high demand since regular stenographers were so unfamiliar with radio terms that it might as well be a foreign language. “I myself would prefer to have a woman of this type,” he wrote, asserting that the position ought to pay “much more” than a regular stenographer.

Though he tried sincerely to argue in their favor, one wonders if women interested in radio operating would really have been satisfied to simply be writing about it.

Unrelated to radio but pertinent to female hams, on August 18, 1920, the Tennessee General Assembly ratified the proposed nineteenth amendment to the Constitution granting universal suffrage for women. It was the thirty-sixth state to do so and the final one required to make it law



Winifred Dow, 7CB

Powerful Radio Signal From Deep Space Repeating in a 16-Day Cycle

By Michelle Starr, Science Alert

One of the defining characteristics of the mysterious deep-space signals we call fast radio bursts is that they are unpredictable. They belch out across the cosmos without rhyme or reason, with no discernible pattern, making them incredibly hard to study. Now, for the first time, astronomers have found a fast radio burst (FRB) that repeats on a regular cycle.

Every 16.35 days, the signal named FRB 180916.J0158+65 follows a similar pattern. For four days, it will spit out a burst or two every hour. Then it falls silent for 12 days. Then the whole thing repeats.

Astronomers with the Canadian Hydrogen Intensity Mapping Experiment (CHIME) Collaboration in Canada observed this cycle for a total of 409 days. We don't yet know what it means; but it could be another piece in the complicated conundrum of FRBs. The research has been uploaded to pre-print server arXiv, where it awaits scrutiny from other experts in the field.

It's easy to become somewhat obsessed with fast radio bursts, a fascinating space mystery that has so far defied any attempts at a comprehensive explanation. To recap, FRBs are hugely energetic flares of radiation in the radio spectrum that last just a few milliseconds at most. In that time frame, they can discharge as much power as hundreds of millions of Suns.

Most of them spark once, and we have never detected them again. But last year, the CHIME collaboration announced they had detected a whopping eight new repeating fast radio bursts, bringing the then-total of repeaters to 10 out of over 150 FRB sources. (Another paper recently brought that total up to 11).

"The discovery of a 16.35-day periodicity in a repeating FRB source is an important clue to the nature of this object," the researchers wrote in their paper. Other objects that demonstrate periodicity tend to be binary systems - stars and black holes. The 16.35-day period could be the orbital period, with the FRB object only facing Earth during a certain part of the orbit.

FRB 180916.J0158+65 is one of the handful of FRBs that have been traced back to a galaxy. It's on the outskirts of a spiral galaxy 500 million light-years away, in a star-forming region. This means a supermassive black hole is unlikely, but a stellar-mass black hole is possible.

"The single constraint on the orbital period still allows several orders of magnitude range in companion mass amongst known stellar-mass compact object binaries: from so-called 'black widow' binary systems, consisting of a low-mass star and a powerful millisecond pulsar whose wind ablates the companion (albeit typically with few-hour orbital periods), to massive O/B stars with highly eccentric companion pulsar orbits," the researchers wrote. Alternatively, winds from the companion object, or tidal disruptions from a black hole, may periodically somehow block the FRB radiation.

It also can't be ruled out that the FRB source is a single, lone object such as a magnetar or X-ray pulsar, although the researchers note this explanation is a little harder to reconcile with the data. That's because those objects have a wobbling rotation that produces periodicity, and none are known to wobble that slowly.

And radio pulsars that do have periodic intervals of several days are orders of magnitude fainter than FRBs. So it's still a mystery. But remember that 11th repeater we mentioned earlier? It was found coming from an FRB astronomers had thought was a one-off -- its repeats were simply too faint for the equipment that had initially been used to look for them.

This suggests that many more FRBs could be repeating, but outside our detection range. And the fact that FRB 180916.J0158+65 seemed more or less the same as other FRBs could mean that other repeating FRBs are also on a cycle - we just haven't detected those cycles yet. So, the next step would be, of course, to continue staring at FRB 180916.J0158+65 for a bit. "Future observations, both intensity and polarimetric, and at all wavebands, could distinguish among models and are strongly encouraged," the researchers wrote, "as are searches for periodicities in other repeaters, to see if the phenomenon is generic."

Many of these FRBs have radio frequencies detected around 1400 MHz, while a few have been detected at lower frequencies in the range of 400–800 MHz.

CALENDAR

March 11, 2020 - 7 pm - Monthly club meeting, ARES update presentation by Dave Galletly, KM2O.

May 9, 2020 - EGARA Hamfest - 8 am to 1 pm - East Greenbush Volunteer Fire Department, Phelps Road.

May 16, 2020 - FCC Exam Session - 10 am to 1 pm - East Greenbush Library. Exams for Technician, General and Amateur Extra.

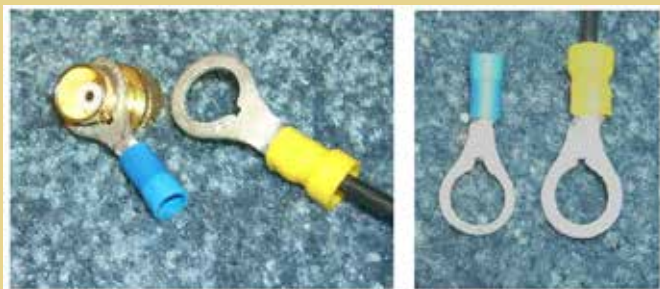
Pro Tip: Make a Tiger Tail for Your HT!

When limited to “barefoot” operation, with a “rubber duck”, HT antennas are not very efficient nor adequate for communications. They fail miserably as an effective radiator due to their design. So, modify that antenna for better results!

A simple, inexpensive and effective method to improve a “rubber duck” antenna is by adding an external counterpoise or “tiger tail” thereby adding the other “half” that’s missing. You can easily build one from a quarter-wave piece, (about 19.5” on 2m, 11.5” for 220 and 6.5” for 440).

The Tail is a 1/4 wave + 5 percent counterpoise wire hung from the HT antenna connector creating a mock 1/2 wave dipole. The trick in making an affective tail is to insure a good tight fit to the HT connector. Ring terminals can often be used with SMA connectors, but a problem with ring terminals are those darn BNC posts. You can fix this by filing a small notch inside the ring to fit over one post, twist it around the BNC barrel and slip it over the other post.

Another approach is stranded insulated wire, crimped and soldered to a battery clip or use a small spring tension clip that will fit the BNC or SMA antenna connector with the wire attached to it. Use a connection that fits tightly but can be removed if needed. Regardless of what method you use, it must make both a good mechanical and electrical connection.



For Sale

- **IFR-1100S Service Monitor. With Spectrum Analyzer and Oscilloscope.** Tested and Calibrated last year. AM - FM, CTCSS Generator, Very good condition. \$900.00
 - **Military Watt Meter AN/URM-120 B/U 2 to 1000 MHZ** Complete and with Carrying Case. In excellent condition. Great Shack / Bench Watt Meter. \$100.00
 - **Yaesu FT-2900 Programing Software by RT Systems** Cable included. used once. Registered, with PW. \$35.00
- For above, contact John at: Radiowizzz@aol.com

-
- **Arrow Model 52-S4 - 4-Element 6 Meter Yagi antenna** in good condition. \$75.00

For above, contact Steve at: svansick@nycap.rr.com

-
- **IFR-1100S Service Monitor. With Spectrum Analyzer and Oscilloscope.** Tested and Calibrated last year. AM - FM, CTCSS Generator, Very good condition. \$900.00
 - **Military Watt Meter AN/URM-120 B/U 2 to 1000 MHZ** Complete and with Carrying Case. In excellent condition. Great Shack / Bench Watt Meter. \$100.00
 - **Yaesu FT-2900 Programing Software by RT Systems** Cable included. used once. Registered, with PW. \$35.00
- For above, contact John at: Radiowizzz@aol.com

-
- **Johnson Valiant Transmitter AM & CW** - \$ 600.00
 - **DX 60 Transmitter AM & CC With VFO** - \$ 125.00
 - **DX 35 Transmitter AM & CW With VFO** - \$ 125.00
 - **Eldico R124 Receiver** - \$300.00
 - **MFJ Model 1995 Portable Antenna, 40 To 10 Meter** - \$75.00

Gear to Sell, Swap or Buy?

Send your listing to W2RBJ@Outlook.com

The East Greenbush Amateur Radio Association

Organized in 1998, by Bert Bruins, N2FPJ, (SK) and Chris Linck, N2NEH, the East Greenbush Amateur Radio Association, an ARRL affiliate, is committed to providing emergency services, educational programs, and operating resources to amateur radio operators and residents of the Capital Region of New York State. The club station is W2EGB. The club also has several VHF and UHF repeaters open to club members and the public.